UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/894,874	06/29/2001	Soon Sung Yoo	041501-5432	3407

30827 7590 01/05/2006

MCKENNA LONG & ALDRIDGE LLP
1900 K STREET, NW
WASHINGTON, DC 20006

EXAMINER	
DOTY, HEATHER ANNE	

ART UNIT	PAPER NUMBER
2813	

DATE MAILED: 01/05/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/894,874	YOO ET AL.	
	Examiner	Art Unit	
	Heather A. Doty	2813	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *27 October 2005*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *6-9,19 and 20* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *6-9,19 and 20* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *31 July 2003 and 29 June 2001* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 112

The amendment to the claims dated 10/27/2005 has overcome the rejection made on 5/05/2005 under 35 U.S.C. 112, second paragraph. The rejection is therefore withdrawn.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 6-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. 5,966,589 (Watanabe et al., hereinafter Watanabe) in view of U.S. 6,016,174 (Endo et al., hereinafter Endo) and U.S. 5,492,582 (Ide et al., hereinafter Ide).

Regarding claim 6, Watanabe discloses a pad structure for a liquid crystal display, comprising:

a substrate **18** (Figs. 4-6: Figs. 5 and 6 are cross sections of Fig. 4);

a tape carrier package layer **3, 5, 9, 12, 13, 14, 15**;

a plurality of gate pads and data pads **3, 5, 9** formed on the substrate 18, each having a "pad contact area and an anisotropic conductive film deposit area" (column 9, lines 51-64)—as recited in the preamble of instant claim 6;

an insulating film **13, 14, 15** formed on surfaces of the gate pads and data pads 3, 5, 9 and therefore in the "pad contact area," the insulating film defining a plurality of contact holes **10a**, **10b**, **10c**, therethrough;

a plurality of transparent conductive layers **12** electrically connected to the gate pads and the data pads **3**, **5**, **9** through the contact holes **10a**, **10b**, **10c** (Figs. 4-6); and

an anisotropic conductive film (not shown) formed on the transparent conductive layers **12** and therefore "on a lower portion of the tape carrier package layer and covering the pad contact area of the liquid crystal display" in order to provide electrical connection between the TFT/pixel array and the driving circuit (the driving circuit also not shown; column 9, lines 51-64),

wherein the entire upper, side, and end surfaces of the gate and data pads are completely covered by the insulating film **13**, **14**, **15** and the transparent conductive layer **12**.

Watanabe does not indicate the extent of coverage of the transparent conductive layers 12 and the insulating layers **13**, **14**, **15** of the tape carrier package layer with the anisotropic conductive film.

Endo teaches a tape carrier package (TCP) LCD having a pad structure on the LCD substrate similar to that in Watanabe for a liquid crystal display including a plurality of gate pads and data pads **20**, **24** formed on the substrate (Figs. 3, 4, and 14; column 14, lines 18-27); an insulating film **3**, **8** formed on surfaces of the gate pads and data pads **20**, **24**; a plurality of transparent conductive layers **22**, **26** formed of indium tin oxide electrically connected to the gate pads and the data pads **20**, **24** (column 19, lines

9-61) through contact holes in the insulating films **3**, **8**; and an anisotropic conductive film, ACF, formed on the transparent conductive layers **22**, **26** to cover entire upper and side surfaces of the transparent conductive layers (not shown but expressly indicated at paragraph bridging columns 11 and 12—especially the last sentence—and at column 23, lines 9-42—especially the last two sentences). In this regard, Endo states,

> In this event, as shown in Fig. 3 and Fig. 4, ACF is placed at the position **completely covering the first TCP terminal contact 22 and the second TCP terminal contact 26**, that is, the first TCP connecting range 23 and the second TCP connecting range 27. By doing so, the contact hole level difference portion of the TCP terminal portion is covered with ACF, and even when crack, etc. are generated in the conductive thin film at the level difference portion, the display portion lead-out electrode is no longer exposed to humidity in the atmosphere, and the corrosion by humidity can be prevented. (Emphasis added.)

Therefore, the ACF of Endo must necessarily be disposed on the insulating films 3, 8 in order to completely cover the terminal contact. In other words, if the ACF were not disposed on a portion of the insulating film **3**, **8**, then the terminal contact would not be completely covered, contrary to the teaching in Endo.

Accordingly, it would have been obvious for one of ordinary skill in the art, at the time of the invention, to cover the entirety of the upper and side surfaces of the transparent conductive film **12** of Watanabe, which in turn covers the portions of the gate and data pads **3**, **5**, and **9** not already covered by the insulating films **13**, **14**, and **15**, with the anisotropic conductive film so as to extend onto the insulating film **13**, **14**, **15**, in order to provide reliable electrical connection to the pads **3**, **5**, **9** while protecting the connection from damage and corrosion due to humidity, as taught to be beneficial in Endo. Further in this regard, note that gate and data pads **3**, **9** shown in the Fig. 7N of

Watanabe having ITO contact portions **12** having ends. Endo shows in Figs. 3 and 4 and states—as in the excerpt above—that the ACF extends beyond the contact holes, "completely covering" the first and second terminal over the "connecting range" to prevent damage from humidity. Accordingly, it would have been obvious for one of ordinary skill in the art, at the time of the invention, to cover the entire ITO structure in Watanabe by ACF, in order to prevent damage from humidity, as taught by Endo.

Then the only difference is that Watanabe in view of Endo does not teach the use of a grinding area or that its proximity to the gate and data pads are separated from the grinding area by a predetermined distance.

Ide teaches a method of mass-producing LCDs, wherein an insulating film portion **11a** is removed from the grinding area (Figs. 2A-3C) before separating the LCDs. Ide teaches that this method allows automation of the process and prevents breakage of the LCDs (column 1, line 55 to column 2, line 10).

It would have been obvious for one of ordinary skill in the art, at the time of the invention, to mass produce the LCDs of Watanabe in view of Endo, in order to save time and money, and thereby to provide a grinding area to separate the mass-produced LCDs. It would further have been obvious for one of ordinary skill in the art, at the time of the invention, to both provide the grinding area at a predetermined distance from the gate and data pads because Endo teaches that the pads should be completely covered to protect them from humidity-induced corrosion, such that one of ordinary skill would know to place the grinding area away from the pads of the such that they are not damaged during separation.

Regarding claim 7, Watanabe discloses that the insulating film **13-15** is formed on side surfaces and upper parts of the gate and data pads **3**, **5**, **9**.

Regarding claim 8, Watanabe discloses that the gate and data pads **3**, **5**, **9** are formed on a substrate **18**, and the insulating film **13-15**—particularly **14**—contacts the substrate at end portions of the gate pads and the data pads **3**, **5**, **9**.

Regarding claim 9, Watanabe discloses that the gate insulating film **14** is formed between the gate and data pads **3**, **5**, **9** (Figs. 4-6).

Claims 19 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. 6,310,667 (Nakayoshi et al., hereinafter Nakayoshi) in view of U.S. 5,492,582 (Ide et al., hereinafter Ide).

Regarding claim 19, Nakayoshi discloses a pad structure for a liquid crystal display comprising:

a substrate **SUB1** (Figs. 5(a)-5(c));

at least one pad (see NOTE below) formed on the substrate **SUB1** (Figs. 5(a)-5(c));

an insulating film **GI**, **PSV1** formed on the pad, the insulating film entirely covering the side and end surfaces of the pad and a portion of the substrate **SUB1** adjacent to the side surfaces of the pad (Figs. 5(a)-5(c)); and

at least one conductive layer **ITO1** connected to the pad through contact holes defined through the insulating film **GI**, **PSV1**, wherein the pad is separated from the grinding area **GCUT1**, **GCUT2**, **GCUT3**, **GCUT4** by a predetermined interval (Fig. 5(c)).

NOTE: The pads are taken to be those portions of the data lines **DL1**, **DL2**, etc., and gate lines **GL1**, **GL2**, etc. directly beneath and not extending beyond the area labeled as drain inspection terminals **DTM** (as **DTM1**, **DTM2**, etc.) and gate inspection terminals **GTM** (as **GTM1**, **GTM2**, etc.). This is consistent with the specification and figure in Nakayoshi because **DTM** and **GTM** are pad contact areas for inspection probes. (See Figs. 5(a)-5(c)); column 15, line 6 to column 16, line 12.)

Regarding claim 20, Nakayoshi discloses a liquid crystal display formed on a substrate **SUB1**, comprising:

An active region **GSO** defined at a first portion of the substrate **SUB1** (Figs. 5(a)-5(c));

A grinding area **GCUT1**, **GCUT2**, **GCUT3**, **GCUT4** defined at a second portion of the substrate SUB1;

A pad contact area (see NOTE above) defined on a second portion of the substrate **SUB1** between and adjacent to each of the active regions **GSO** and the grinding regions **GCUT1**, **GCUT2**, **GCUT3**, **GCUT4,** the pad contact areas **DL1, GL1,** etc., including:

at least one pad formed on the substrate **SUB1**;

an insulating film **GI**, **PSV1** formed on the pad;

at least one conductive layer **ITO1** connected to the pad through contact holes defined through the insulating film **GI**, **PSV1**, wherein the insulating film **GI**, **PSV1** covers the entire side and end surfaces of the pad and a portion of the substrate **SUB1** adjacent to the side and end surfaces of the pad, such that the conductive layer **ITO1** is

not formed in the grinding area **GCUT1**, **GCUT2**, **GCUT3**, **GCUT4**, as shown in Figs. 5(a)-5(c), and

wherein the pad is separated from the grinding area **GCUT1**, **GCUT2**, **GCUT3**, **GCUT4** by a predetermined interval.

As applied to each of claims 19 and 20 above, Nakayoshi does not indicate that the insulating film **GI**, **PSV1** is not formed in the grinding areas.

Ide teaches a method of mass-producing LCDs, wherein an insulating film portion **11a** is removed from the grinding area (Figs. 2A-3C) before separating the LCDs. Ide teaches that this method allows automation of the process and prevents breakage of the LCDs (column 1, line 55 to column 2, line 10).

It would have been obvious for one of ordinary skill in the art, at the time of the invention, to leave the insulating film off of the grinding areas in Nakayoshi in order to automate the process and not break the substrates.

Response to Arguments

Applicant's arguments filed 10/27/2005 have been fully considered but they are not persuasive.

Regarding claims 6-9, Applicant primarily argues (see pp. 5-6) that the combination of Watanabe, Endo, and Ide does not teach "wherein the entire upper, side, and end surfaces of the gate and data pads are completely covered by the insulating film and the anisotropic conductive film."

However, Figs. 5 and 6 of Watanabe show gate and data pads **3**, **5**, and **9** completely covered by the insulating film (on the end surfaces and left and right sides of

the top surface) and the transparent conductive layer **12** (on the central top surface). The transparent conductive layer **12** is in turn entirely covered by the anisotropic conductive film, as taught by the combination of Watanabe and Endo. Therefore the gate and data pads *are* completely covered by the combination of the insulating film and the anisotropic film.

Regarding claims 19 and 20, Applicant argues that **DTM** and **GTM** are inspection terminals and **DTCP** and **GTCP** are the data and gate terminals for inputting data and date signals into the display (p. 7, first paragraph).

However, this argument is not persuasive because claims 19 and 20 do not specify that the pad be used to input data or gate signals into the display. **DTM** and **GTM** are pad contact areas for inspection probes, and therefore qualify as pads.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Heather A. Doty, whose telephone number is 571-272-8429. The examiner can normally be reached on M-F, 8:30 - 5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Carl Whitehead, Jr., can be reached at 571-272-1702. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

had

LAURA M. SCHILLINGER
PRIMARY EXAMINER